

white or pale pink, dorsal auricle short triangular, with a pair of perpendicular blue bands, 0.3–0.4 mm, inner side with prominent dark blue honey guides. Stamens with white filaments, anthers deep pink, pollen pale pink. Ovary linear, acute. Capsules c. 1 cm long, inflated in the middle, acuminate with a short beak, glabrous, c. six-seeded; seeds spherical, 1–1.5 × 1.8 mm smooth, black, shining.

**Micro-morphological characters.** *Pollen morphology*: Four-colpate, rectangular, 33–35 × 20 µm, exine simple reticulate, reticulum fine, muri thick, obscurely dupli-baculate, lumen 3 × 3, 3 × 2, 2 × 2 µm, intra-luminal bacules seemingly present. Chromosome number:  $n = 8$ .

**Etymology**: The species is named after the type locality, Bhimgad Wildlife Sanctuary.

**Phenology**: Flowers in August–September and fruits in October.

**Ecology**: A small population found growing amidst grasses, *Habenaria heyneana*, *Eriocaulon* spp., *Crinum* sp., etc. on lateritic soil in a valley on the way to Wroughton's free-tailed bats cave in the sanctuary.

**Distribution and conservation status**. Presently it is known only from the Bhimgad Wildlife Sanctuary in the Western Ghats of Belagavi district, Karnataka. The habitat in the type locality is fairly intact. The conservation status is presently assessed as Data Deficient according to IUCN categories<sup>14</sup>, needing

survey of similar habitats in adjoining areas.

*Impatiens bhimgadensis* is morphologically similar to *I. rupicol* Hook. f. and *I. ramosissima* Dalzell (reinstated by the first author in a separate publication) of section *Annuae*, but differs in many characters (Table 1).

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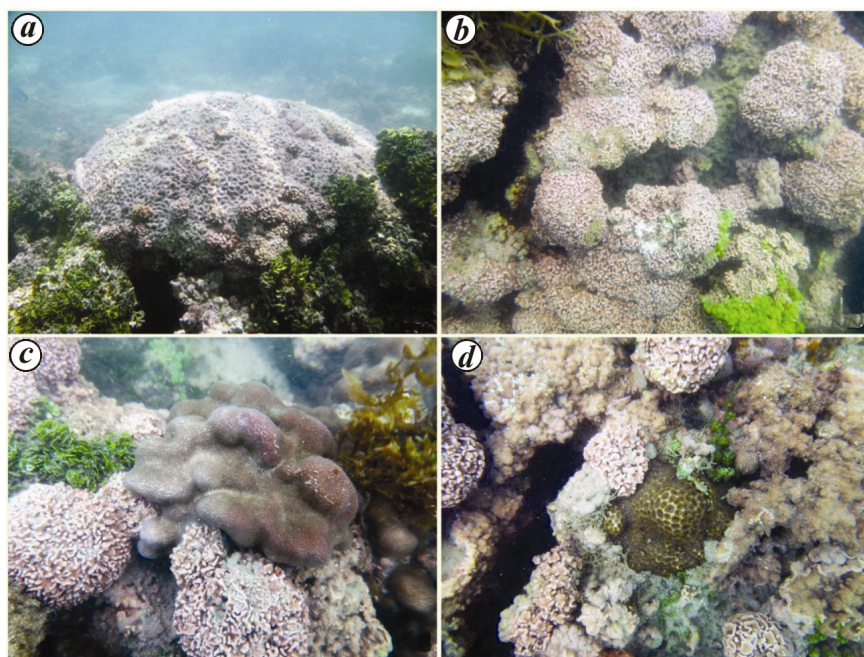
## Occurrence of live rhodolith bed of *Lithophyllum kotschyannum* Unger (Corallinaceae: Lithophylloideae) in Palk Bay: first record from India

Rhodoliths are nodular form of marine free-living, non-geniculate, crustose coralline red algae, resembling the corals. The communities, in which they dominate are referred to as 'rhodolith beds', 'rhodolites' or 'maerl'. Rhodoliths assume different sizes, shapes and forms (small thalli-like, twig-like, large round shaped, branching/unbranching, etc.) based on different factors such as water motion, bioturbation, grazing, fouling, bleaching, etc.<sup>1</sup>. The thin encrusting forms of crustose coralline algae strengthen the reef frame against mechanical destruction, whereas the contribution of unattached rhodoliths towards

strengthening the reef frames is not significant<sup>2</sup>. Rhodolith beds provide habitat for many associated invertebrates and macro-flora and are recognized as environmental recorders<sup>3</sup> as they contribute in palaeoclimatic reconstructions over a broad range of temporal and spatial scales<sup>4</sup>. These coralline algae produce growth bands with a morphology and chemistry that record environmental variation<sup>3</sup>.

Rhodolith beds are ubiquitous and occur from low intertidal zone to depths of over 150 m in tropical to polar sea<sup>5</sup>. In India, rhodolith beds are reported from the Aramda reef member (Late Pleisto-

cene to Holocene) of Chaya Formation, Gujarat<sup>6</sup>, wherein the sectional studies of the bed revealed the presence of non-geniculate coralline algal genera such as *Lithoporella*, *Lithothamnion*, *Lithophyllum*, *Porolithon* and *Sporolithon*. During the underwater surveys conducted in the coral reefs of Mandapam region, Palk Bay (79°8'44.785"E, 9°17'35.955"N to 79°9'4.294"E, 9°17'37.355"N), rhodolith beds spanning about 30,000 m<sup>2</sup> were found encrusting over the dead (partly or fully) corals (Figure 1 a, b). *Lithophyllum kotschyannum* Unger was dominant among the rhodoliths in the reef region. The seaward side of the reef crest was



**Figure 1.** Live rhodoliths in the coral reefs of Palk Bay. *a, b*, Live rhodoliths over dead corals; *c*, Rhodoliths over growing *Porites lobata*; *d*, *Leptastrea transversa*.

dominated by either fleshy seaweeds (*Sargassum* spp, *Turbinaria* spp.) or *Lithophyllum* sp. Live rhodoliths are commonly seen on calcareous sediment predominantly with dead coral fragments<sup>1</sup>. However rhodoliths were also observed to be profusely growing over the live tissues of massive coral, *Porites lobata* (Figure 1 c) and *Leptastrea transversa* (Figure 1 d) during the present study. This study is the first report on the occurrence of live rhodolith bed from coral reefs of Palk Bay. In India, rhodolith beds are reported from Gujarat (Late Pleistocene to Holocene)<sup>6</sup> and *L. kotschyianum* have been recorded from Lakshadweep Islands<sup>7</sup> but, live beds on the coral reef area are not yet reported.

Studies on the association of corals with rhodolith beds in Gulf of California revealed that the growth of *Porites* can be stopped by the coralline algae or even reversed due to relative competitive

abundance<sup>8</sup>. The corals suffer tissue lesion on contact with algal tissue, leading to creation of a zone of clean skeleton, which subsequently is covered by the filamentous algae. Globally, ecological studies on rhodolith beds are scanty<sup>3</sup> and the present report on their occurrence in Palk Bay reefs signify the need for detailed studies on their structure, function, pattern of distribution, associated biodiversity and the possible ecological impacts.

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